

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

32860-000196

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

10/030302

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/DE00/01343

April 28, 2000

May 11, 1999

TITLE OF INVENTION

INSULATION DISPLACEMENT CONTACT AND CONNECTOR

APPLICANT(S) FOR DO/EO/US

Johann HERRMAN and Guenther WEISSBERGER

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau). WO 00/
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☒ is transmitted herewith.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4)
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 20. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98-1.449 and International Search Report (PCT/ISA/210) in German with Six (6) references.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☒ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:
  - 1) One (1) sheet of Formal Drawings
  - 2) Amended Letter and Amended Sheets

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

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INTERNATIONAL APPLICATION NO.

PCT/DE00/01343

ATTORNEY'S DOCKET NUMBER

32860-000196

21. ☒ The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5):**

Neither international preliminary examination fee (37 CFR 1.482)

nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO

and International Search Report not prepared by the EPO or JPO. . . . . \$1,040.00

International preliminary examination fee (37 CFR 1.482) not paid to

USPTO but International Search Report prepared by the EPO or JPO . . . . . \$890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO

but international search fee (37 CFR 1.445(a)(2)) paid to USPTO. . . . . \$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO

but all claims did not satisfy provisions of PCT Article 33(1)-(4) . . . . . \$690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO

and all claims satisfied provisions of PCT Article 33(1)-(4) . . . . . \$100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

**CALCULATIONS**

**PTO USE ONLY**

\$ 890.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30

months from the earliest claimed priority date (37 CFR 1.492(e)).

\$ 0

CLAIMS

NUMBER FILED

NUMBER EXTRA

RATE

Total Claims 24 - 20 = 4

X \$18.00 \$ 72.00

Independent

1 - 3 =

0

X \$80.00 \$ 0

Claims

MULTIPLE DEPENDENT CLAIM(S) (if applicable)

None

+ \$270.00 \$ 0

**TOTAL OF ABOVE CALCULATIONS =**

\$ 962.00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.

\$ 0

**SUBTOTAL =**

\$ 962.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30

months from the earliest claimed priority date (37 CFR 1.492(f)).

+ \$ 0

**TOTAL NATIONAL FEE =**

\$ 962.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be

accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property

\$ 40.00

+

**TOTAL FEES ENCLOSED =**

\$ 1,002.00

Amount to be:

refunded \$

charged \$

a. ☐ A check in the amount of \$ \_\_\_\_\_ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account. No. 08-0750 in the amount of \$1,002.00 to cover the above fees. A triplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 08-0750.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

Send all correspondence to:

Harness, Dickey & Pierce, P.L.C. - Customer No. 30596

Post Office Box 8910

Reston, Virginia 20195

Date: November 9, 2001

By

Donald J. Daley, #4,313

/s/

PATENT  
32860-000196

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicants: Johann HERRMAN and Guenther WEISSBERGER  
Int'l App. No.: PCT/DE00/01343  
Application No.: NEW  
Filed: November 9, 2001  
For: INSULATION DISPLACEMENT CONTACT AND CONNECTOR

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, DC 20231

November 9, 2001

Sir:

The following preliminary amendments and remarks are respectfully submitted in connection with the above-identified application.

**IN THE ABSTRACT**

Please replace the Abstract with the attached revised Abstract.

**IN THE CLAIMS**

Please replace the original claims with the following new claims:

1. (Amended) An insulation displacement contact, comprising:

a slotted, sprung contact region as a contact-making slot formed on a connecting bracket; and

an outer spring clip surrounding and reinforcing the contact region, wherein the spring clip forms an insulation displacement blade in at least one end region, the blade in the at least one end region forming an entry region capable of cutting and located in front of the contact region.

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2. (Amended) The insulation displacement contact as claimed in claim 1, wherein the contact-making slot includes at least one blunt contact zone to protect a conductor core.

3. (Amended) The insulation displacement contact as claimed in claim 2, wherein the spring clip and blade are formed from suitably hard material, and wherein the contact region is formed from electrically conductive material.

4. (Amended) The insulation displacement contact as claimed in claim 1, wherein each connecting bracket forms a contact-making slot at each of its ends.

5. (Amended) The insulation displacement contact as claimed in claim 1, wherein at least one of the spring clip and the connecting bracket are designed such that the limbs of the spring clip secure the contact-making slot in its position.

6. (Amended) The insulating displacement contact as claimed in claim 1, wherein the cutting blade on the end region forms an entry region capable of cutting, and located in front of the contact region.

7. (Amended) A connecting terminal having at least one insulation displacement contact as claimed in claim 1.

8. (Amended) A terminal strip having at least one insulation displacement contact as claimed in claim 1.

**Please add the following new claims:**

-- 9. The insulation displacement contact as claimed in claim 2, wherein each connecting bracket forms a contact-making slot at each of its ends.

10. The insulation displacement contact as claimed in claim 3, wherein each connecting bracket forms a contact-making slot at each of its ends.

11. The insulation displacement contact as claimed in claim 2, wherein at least one of the spring clip and the connecting bracket are designed such that the limbs of the spring clip secure the contact-making slot in its position.

12. The insulation displacement contact as claimed in claim 3, wherein at least one of the spring clip and the connecting bracket are designed such that the limbs of the spring clip secure the contact-making slot in its position.

13. An insulating displacement contact as claimed in claim 2, wherein the cutting blade on the end region forms an entry region capable of cutting, and located in front of the contact region.

14. An insulating displacement contact as claimed in claim 3, wherein the cutting blade on the end region forms an entry region capable of cutting, and located in front of the contact region.

15. A connecting terminal having at least one insulation displacement contact as claimed in claim 2.

16. A connecting terminal having at least one insulation displacement contact as claimed in claim 3.

17. A connecting terminal having at least one insulation displacement contact as claimed in claim 4.

18. A connecting terminal having at least one insulation displacement contact as claimed in claim 5.

19. A connecting terminal having at least one insulation displacement contact as claimed in claim 6.

20. A terminal strip having at least one insulation displacement contact as claimed in claim 2.
21. A terminal strip having at least one insulation displacement contact as claimed in claim 3.
22. A terminal strip having at least one insulation displacement contact as claimed in claim 4.
23. A terminal strip having at least one insulation displacement contact as claimed in claim 5.
24. A terminal strip having at least one insulation displacement contact as claimed in claim 6. --

**REMARKS**

Claims 1-24 are now present in this application, with new claims 9-24 being added by the present Preliminary Amendment. It should be noted that the amendments to original claims 1-8 of the present application are non-narrowing amendments, made solely to place the claims in proper form for U.S. practice and not to overcome any prior art or for any other statutory considerations. For example, amendments have been made to broaden the claims; remove reference numerals in the claims; remove the European phrase "characterized in that"; remove multiple dependencies in the claims; and to place claims in a more recognizable U.S. form, including the use of the transitional phrase "comprising" as well as the phrase "wherein". Other such non-narrowing amendments include changing "and/or" to -at least one of—and placing apparatus-type claims in a more recognizable U.S. form (setting elements forth in separate paragraphs, for example). Again, all amendments are non-

narrowing and have been made solely to place the claims in proper form for U.S. practice and not to overcome any prior art or for any other statutory considerations.

### **SUBSTITUTE SPECIFICATION**

In accordance with 37 C.F.R. §1.125, a substitute specification has been included in lieu of substitute paragraphs in connection with the present Preliminary Amendment. The substitute specification is submitted in clean form, attached hereto, and is accompanied by a marked-up version showing the changes made to the original specification. The changes have been made in an effort to place the specification in better form for U.S. practice. No new matter has been added by these changes to the specification. Further, the substitute specification includes paragraph numbers to facilitate amendment practice as requested by the U.S. Patent and Trademark Office.

### **CONCLUSION**

Accordingly, in view of the above amendments and remarks, an early indication of the allowability of each of claims 1-24 in connection with the present application is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Donald J. Daley at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY & PIERCE, P.L.C

By: 

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DJD:kna

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ABSTRACT OF THE DISCLOSURE

An insulation displacement contact, for example for terminal strips, which has a slotted, sprung contact region as a contact-making slot on a connecting bracket, which contact region is surrounded and reinforced by an outer spring slip. The invention provides that the spring clip is designed to form an insulation displacement blade in at least one end region.

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Description

Insulation displacement contact, and a connecting terminal

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*FIELD OF THE INVENTION* generally  
 The invention relates to an insulation displacement contact, for example, for terminal strips, which has a slotted, sprung contact region as a contact-making slot on a connecting bracket, *More preferably, it relates to an insulation displacement contact including* wherein the contact region is

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surrounded and reinforced by an outer spring slip. *BACKGROUND OF THE INVENTION* Such a known insulation displacement contact is known, *disclosed in* DE-C1-197 32 1827, for example. Further,

- DE 85 25 981 U1 discloses a two-part insulation displacement contact element, in which two separate contact elements having a contact-making slot are used. These surround both sides of a conductor with which contact is to be made, and pinch this conductor between them. When contact has been made, the first contact element in this case surrounds the other, like a spring clip. The respective contact-making slots are in this case widened like funnels in their entry region, forming an insulation displacement contact. In this embodiment, the insulation displacement contacts must be operated like tongs once the conductor has been inserted.

In the described, known insulation displacement contact, the material of the spring clip can be matched to the spring characteristics, *further* and the contact region can be matched by shaping and the material coming to a compromise in order to achieve a cutting region and a contact region.

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*SUMMARY OF THE INVENTION*  
 The invention is based on the object of developing the described insulation displacement contact further, such

that its cutting characteristics and contact characteristics can be even better matched.

- The described object is achieved by an insulation displacement contact as claimed in claim 1. In this case, the spring clip is designed to form an insulation displacement blade in at least one end region. This results in a cutting blade, or initial cutting blade in an initial cutting region, composed of mechanically particularly hard material, so that even cold, brittle insulation on a conductor can easily be cut down to a conductive core. The shape of the contact region in the interior of the contact-making slot can also be matched to achieve particularly good contact characteristics.
- 15 The contact-making slot can thus be formed with blunt contact zones in order to protect a contact core, since the cutting blades which are formed from the spring clip, can be matched not only in terms of the initial cutting characteristics but also, if required, in terms of their secondary cutting characteristics.
- for example*  
*As such*  
*This is due to the fact that*

The spring clip and cutting blades which are formed from the spring clip may be formed from suitably hard material. If required, the cutting blades may be specially hardened. The contact region may be formed from electrically highly conductive material.

The insulation displacement contact can advantageously be designed for use in a connecting terminal, in particular in a terminal strip, such that each connecting bracket forms a contact-making slot at each of its ends.

The spring clip and/or connecting bracket can advantageously be designed such that the limbs of the spring clip secure the contact-making slot in its position.

A connecting terminal having at least one insulation displacement contact can advantageously be provided according to one of the embodiments described above. In particular, a terminal strip having at least one insulation displacement contact can be provided in the embodiments described above.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be explained in more detail with reference to an exemplary embodiment which is illustrated, in perspective form, in the drawings, and in which:

*the drawing figure illustrates*  
DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS  
a slotted, sprung contact region ~~is in each case~~ formed as a contact-making slot 2 on a connecting bracket 1. This contact region is surrounded by an outer spring clip 3, reinforcing its spring effect. *the drawing illustrates* The spring clip 3 is designed to form cutting blades 4 in at least one end region, in the exemplary embodiment, *shown in the drawing* in both end regions. The cutting blades 4 form a V-shaped entry region for initial cutting and for cutting open the insulation of a conductor to be inserted and to be

connected. This can be followed by a secondary cutting region and also by the contact region itself. In the exemplary embodiment, a subsequent

shown in  
the drawing

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cutting region 5 is followed by a contact region 6, which is advantageously formed to be blunt and to be ~~composed~~ of electrically highly conductive material, thus protecting a conductor core. A secondary cutting  
5 region 5 may be in the form not only of the spring clip but also in the form of the connecting bracket 1, depending on the specific requirements.

The spring clip 3 and connecting bracket 1 in the  
10 exemplary embodiment have recesses and tongues such that the limbs of the spring clip 1 secure the contact-making slot 2 in its position. This prevents the limbs from being tilted and deflected into a number of planes, even when a number of conductors are inserted.

15 In the exemplary embodiment, the connecting bracket 1 forms a contact-making slot 2 at each of its ends.

A connecting terminal having at least one insulation  
20 displacement contact can advantageously be formed in one of the described embodiments. In particular, a terminal strip having screwless connections can be formed in this way.

*VARIATIONS*  
*of*

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*What is claimed is:*  
~~Patent Claims~~

*Comprising:*

1. *(Amended)* An insulation displacement contact, (for example for terminal strips, which has <sup>formed</sup> a slotted, sprung contact region as a contact-making slot (2)) on a connecting bracket (1), (which contact region is surrounded and reinforced by an outer spring clip (3), <sup>surrounding and reinforcing the contact region</sup> characterized in that <sup>wherein</sup> the spring clip (3) is designed to form <sup>forms</sup> an insulation displacement blade (4) in, at least one end region <sup>at least one end region</sup> [with] the [cutting] blade (4) on the end region [or regions] forming an entry region [which is] capable of cutting and [is] located in front of the contact region.
2. *(Amended)* The insulation displacement contact as claimed in claim 1, [characterized in that] <sup>wherein</sup> the contact-making slot (2) is designed with <sup>includes at least one zone</sup> blunt contact zones [in order] to protect a conductor core.
3. *(Amended)* The insulation displacement contact as claimed in claim 2, [characterized in that] <sup>wherein</sup> the spring clip (3) and cutting blades (4) <sup>blade</sup> are formed from suitably hard material, and [in that] <sup>wherein</sup> the contact region (6) is formed from electrically [highly] conductive material.
4. *(Amended)* The insulation displacement contact as claimed in one of the preceding claims, <sup>claim 1</sup> characterized in that <sup>wherein</sup> each connecting bracket (1) forms a contact-making slot (2) at each of its ends.
5. *(Amended)* The insulation displacement contact as claimed in one of the preceding claims, <sup>claim 1</sup> characterized in that <sup>wherein at least one</sup> the spring clip (3) and/or the connecting bracket (1) are designed such that the limbs of the spring clip (1) secure the contact-making slot (2) in its position.
6. *(Amended)* <sup>The</sup> An insulating displacement contact as claimed in one of the preceding claims, <sup>claim 1</sup> characterized in that <sup>wherein</sup> the

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Abstract

Insulation displacement contact, and a connecting terminal

An insulation displacement contact, for example for terminal strips, which <sup>includes</sup> has a slotted, sprung contact region as a contact-making slot (2) on a connecting bracket (1), <sup>the</sup> which contact region is surrounded and reinforced by an outer spring slip (3). ~~The invention provides that~~ the spring clip (3) is designed to form an insulation displacement blade (4) in at least one end region.

Figure 1

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cutting blade on the end region forms an entry region which is capable of cutting, and is located in front of the contact region.

7. (Amended) A connecting terminal having at least one insulation displacement contact as claimed in one of claims 1 to 3 of claim 1

8. (Amended) A terminal strip having at least one insulation displacement contact as claimed in one of claims 1 to 3 of claim 1

New

9. same as 4, but dep m 2 3  
10. " 4, " " 3  
11. " 5, " " 2  
12. " 5 " " 3  
13. " 6 " " 2  
14. " 6 " " 3  
15. same as 7, but dep m 2 3  
16. " 7 " " 4  
17. " 7 " " 5  
18. " 7 " " 6  
19. " 8 " " 2  
20. " 8 " " 3  
21. " 8 " " 4  
22. " 8 " " 5  
23. " 8 " " 6  
24. " 8 " " 6

## SUBSTITUTE SPECIFICATION

### INSULATION DISPLACEMENT CONTACT AND CONNECTOR

[0001] This application is the national phase under 35 U.S.C. § 371 of PCT International Application No. PCT/DE00/01343 which has an International filing date of April 28, 2000, which designated the United States of America, the entire contents of which are hereby incorporated by reference.

#### Field of the Invention

[0002] The invention generally relates to an insulation displacement contact. More preferably, it relates to an insulation displacement contact for terminal strips, including a slotted, sprung contact region as a contact-making slot on a connecting bracket, wherein the contact region is surrounded and reinforced by an outer spring slip.

#### Background of the Invention

[0003] A known insulation displacement contact is disclosed in (DE-C1-197 32 182), for example. Further, DE 85 25 981 U1 discloses a two-part insulation displacement contact element, in which two separate contact elements having a contact-making slot are used. These surround both sides of a conductor with which contact is to be made, and pinch this conductor between them. When contact has been made, the first contact element surrounds the other, like a spring clip. The respective contact-making slots are widened like funnels in their entry region, forming an insulation displacement contact. In this embodiment, the insulation displacement contacts must be operated like tongs once the conductor has been inserted.

[0004] In the described, known insulation displacement contact, the material of the spring clip can be matched to the spring characteristics. Further, the contact region can be matched by shaping and the material coming to a compromise in order to achieve a cutting region and a contact region.

### SUMMARY OF THE INVENTION

[0005] The invention is based on an object of developing the described insulation displacement contact further, such that its cutting characteristics and contact characteristics can be even better matched.

[0006] The described object is achieved by an insulation displacement contact as claimed in claim 1, for example. In this case, the spring clip is designed to form an insulation displacement blade in at least one end region. This results in a cutting blade, or initial cutting blade in an initial cutting region, of mechanically particularly hard material. As such, even

cold, brittle insulation on a conductor can easily be cut down to a conductive core. The shape of the contact region in the interior of the contact-making slot can also be matched to achieve particularly good contact characteristics. The contact-making slot can thus be formed with blunt contact zones in order to protect a contact core. This is due to the fact that the cutting blades which are formed from the spring clip, can be matched not only in terms of the initial cutting characteristics but also, if required, in terms of their secondary cutting characteristics.

[0007] The spring clip and cutting blades which are formed from the spring clip may be formed from suitably hard material. If required, the cutting blades may be specially hardened. The contact region may be formed from electrically highly conductive material.

[0008] The insulation displacement contact can advantageously be designed for use in a connecting terminal, in particular in a terminal strip, such that each connecting bracket forms a contact-making slot at each of its ends.

[0009] The spring clip and/or connecting bracket can advantageously be designed such that the limbs of the spring clip secure the contact-making slot in its position.

[00010] A connecting terminal having at least one insulation displacement contact can advantageously be provided according to one of the embodiments described above. In particular, a terminal strip having at least one insulation displacement contact can be provided in the embodiments described above.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[00011] The invention will now be explained in more detail with reference to an exemplary embodiment which is illustrated, in perspective form, in the drawing.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[00012] The drawing figure illustrates a slotted, sprung contact region formed as a contact-making slot 2 on a connecting bracket 1. This contact region is surrounded by an outer spring clip 3, reinforcing its spring effect.

[00013] The spring clip 3 is designed to form cutting blades 4 in at least one end region, in the exemplary embodiment shown in the drawing, in both end regions. The cutting blades 4 form a V-shaped entry region for initial cutting and for cutting open the insulation of a conductor to be inserted and to be connected. This can be followed by a secondary cutting region and also by the contact region itself.

[00014] In the exemplary embodiment shown in the drawing, a subsequent cutting region 5 is followed by a contact region 6, which is advantageously formed to be blunt and to be of electrically highly conductive material, thus protecting a conductor core. A secondary cutting region 5 may be in the form not only of the spring clip but also in the form of the connecting bracket 1, depending on the specific requirements.

[00015]The spring clip 3 and connecting bracket 1 in the exemplary embodiment have recesses and tongues such that the limbs of the spring clip 1 secure the contact-making slot 2 in its position. This prevents the limbs from being tilted and deflected into a number of planes, even when a number of conductors are inserted.

[00016]In the exemplary embodiment, the connecting bracket 1 forms a contact-making slot 2 at each of its ends.

[00017]A connecting terminal having at least one insulation displacement contact can advantageously be formed in one of the described embodiments. In particular, a terminal strip having screwless connections can be formed in this way.

[00018]The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

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### Description

Insulation displacement contact, and a connecting terminal

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The invention relates to an insulation displacement contact, for example for terminal strips, which has a slotted, sprung contact region as a contact-making slot on a connecting bracket, which contact region is surrounded and reinforced by an outer spring slip. Such an insulation displacement contact is known (DE-C1-197 32 182).

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DE 85 25 981 U1 discloses a two-part insulation  
15 displacement contact element, in which two separate  
contact elements having a contact-making slot are used.  
These surround both sides of a conductor with which  
contact is to be made, and pinches this conductor  
between them. When contact has been made, the first  
20 contact element in this case surrounds the other, like  
a spring clip. The respective contact-making slots are  
in this case widened like funnels in their entry  
region, forming an insulation displacement contact. In  
this embodiment, the insulation displacement contacts  
25 must be operated like tongs once the conductor has been  
inserted.

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In the described, known insulation displacement contact, the material of the spring clip can be matched to the spring characteristics, and the contact region can be matched, by shaping and the material coming to a compromise in order to achieve a cutting region and a contact region.

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35 The invention is based on the object of developing the described insulation displacement contact further such

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that its cutting characteristics and contact characteristics can be even better matched.

- 5 The described object is achieved by an insulation displacement contact as claimed in claim 1. In this case, the spring clip is designed to form an insulation displacement blade in at least one end region. This results in a cutting blade, or initial cutting blade in an initial cutting region, composed of mechanically
- 10 particularly hard material, so that even cold, brittle insulation on a conductor can easily be cut down to a conductive core. The shape of the contact region in the interior of the contact-making slot can also be matched to achieve particularly good contact characteristics.
- 15 The contact-making slot can thus be formed with blunt contact zones in order to protect a contact core, since the cutting blades which are formed from the spring clip can be matched not only in terms of the initial cutting characteristics but also, if required, in terms
- 20 of their secondary cutting characteristics.

The spring clip and cutting blades which are formed from the spring clip may be formed from suitably hard material. If required, the cutting blades may be specially hardened. The contact region may be formed from electrically highly conductive material.

The insulation displacement contact can advantageously be designed for use in a connecting terminal, in particular in a terminal strip, such that each connecting bracket forms a contact-making slot at each of its ends.

The spring clip and/or connecting bracket can advantageously be designed such that the limbs of the spring clip secure the contact-making slot in its position.

A connecting terminal having at least one insulation displacement contact can advantageously be provided according to one of the embodiments described above. In particular, a terminal strip having at least one insulation displacement contact can be provided in the embodiments described above.

The invention will now be explained in more detail with reference to an exemplary embodiment which is illustrated, in perspective form, in the drawing, and in which:

a slotted, sprung contact region is in each case formed as a contact-making slot 2 on a connecting bracket 1. This contact region is surrounded by an outer spring clip 3, reinforcing its spring effect. The spring clip 3 is designed to form cutting blades 4 in at least one end region, in the exemplary embodiment in both end regions. The cutting blades 4 form a V-shaped entry region for initial cutting and for cutting open the insulation of a conductor to be inserted and to be

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connected. This can be followed by a secondary cutting region and also by the contact region itself. In the exemplary embodiment, a subsequent

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cutting region 5 is followed by a contact region 6, which is advantageously formed to be blunt and to be composed of electrically highly conductive material, thus protecting a conductor core. A secondary cutting region 5 may be in the form not only of the spring clip but also in the form of the connecting bracket 1, depending on the specific requirements.

10 The spring clip 3 and connecting bracket 1 in the exemplary embodiment have recesses and tongues such that the limbs of the spring clip 1 secure the contact-making slot 2 in its position. This prevents the limbs from being tilted and deflected into a number of planes, even when a number of conductors are inserted.

15 In the exemplary embodiment, the connecting bracket 1 forms a contact-making slot 2 at each of its ends.

20 A connecting terminal having at least one insulation displacement contact can advantageously be formed in one of the described embodiments. In particular, a terminal strip having screwless connections can be formed in this way.

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Patent Claims

1. An insulation displacement contact, for example for terminal strips, which has a slotted, sprung contact region as a contact-making slot (2) on a connecting bracket (1), which contact region is surrounded and reinforced by an outer spring clip (3), characterized in that the spring clip (3) is designed to form an insulation displacement blade (4) in at least one end region, with the cutting blade (4) on the end region or regions forming an entry region which is capable of cutting and is located in front of the contact region.
2. The insulation displacement contact as claimed in claim 1, characterized in that the contact-making slot (2) is designed with blunt contact zones in order to protect a conductor core.
3. The insulation displacement contact as claimed in claim 2, characterized in that the spring clip (3) and cutting blades (4) are formed from suitably hard material, and in that the contact region (6) is formed from electrically highly conductive material.
4. The insulation displacement contact as claimed in one of the preceding claims, characterized in that each connecting bracket (1) forms a contact-making slot (2) at each of its ends.
5. The insulation displacement contact as claimed in one of the preceding claims, characterized in that the spring clip (3) and/or the connecting bracket (1) are designed such that the limbs of the spring clip (1) secure the contact-making slot (2) in its position.
6. An insulating displacement contact as claimed in one of the preceding claims, characterized in that the

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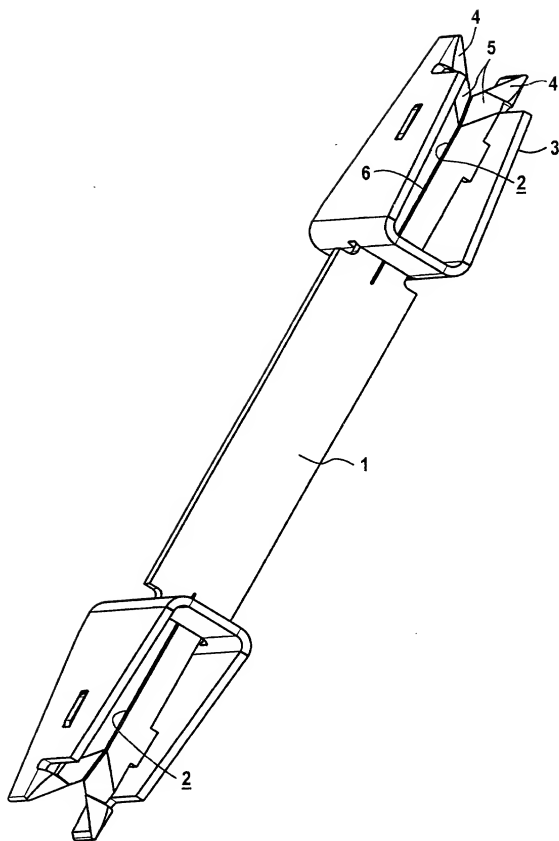
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cutting blade on the end region forms an entry region which is capable of cutting and is located in front of the contact region.

7. A connecting terminal having at least one  
5 insulation displacement contact as claimed in one of claims 1 to 6.

8. A terminal strip having at least one insulation displacement contact as claimed in one of claims 1 to 6.

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# Declaration and Power of Attorney For Patent Application

## Erklärung Für Patentanmeldungen Mit Vollmacht

### German Language Declaration

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dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

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Schneidklemmkontakt und  
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deren Beschreibung

(zutreffendes ankreuzen)

☐ hier beigefügt ist.

☒ am 28.04.2000 als

PCT internationale Anmeldung

PCT Anmeldungsnummer PCT/DE00/01343

eingereicht wurde und am

abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

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As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

INSULATION DISPLACEMENT  
CONTACT AND CONNECTOR

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on 28.04.2000 as

PCT international application

PCT Application No. PCT/DE00/01343

and was amended on \_\_\_\_\_  
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

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Prior foreign applications  
Priorität beansprucht

Priority Claimed

19921769.6

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11.05.1999

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(Number)  
(Number)

(Country)  
(Land)

(Day Month Year Filed)  
(Tag Monat Jahr eingereicht)

Yes  
Ja

No  
Nein

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(Number)

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(Land)

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(Tag Monat Jahr eingereicht)

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Ja

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Nein

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(Number)

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(Land)

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Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/01343

(Application Serial No.)  
(Anmeldeseriennummer)

28.04.2000

(Filing Date D, M, Y)  
(Anmeldedatum T, M, J)

(Status)

(patentiert, anhängig,  
aufgegeben)

pending

(Status)

(patented, pending,  
abandoned)

(Application Serial No.)  
(Anmeldeseriennummer)

(Filing Date D,M,Y)  
(Anmeldedatum T, M, J)

(Status)

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

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Unterschrift des Erfinders, <i>Johann Herrmann</i>	Datum <i>22.10.01</i>	Inventor's signature <i>Johann Herrmann</i> Date <i>22.10.01</i>	
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Voller Name des zweiten Miterfinders (falls zutreffend). <b>GÜNTHER WEISSBERGER</b>		Full name of second joint inventor, if any: <b>GÜNTHER WEISSBERGER</b>	
Unterschrift des Erfinders	Datum	Second inventor's signature <i>G. Weissberger</i> Date <i>22.10.01</i>	
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Staatsangehörigkeit <b>DEUTSCH</b>		Citizenship <b>GERMAN</b>	
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(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

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